

In re: An et al.
Serial No.: 10/705,680
Filed: November 10, 2003
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REMARKS

Applicants respond herein to each of the issues raised in the Office Action. Applicants submit that the present application is in form for allowance for at least the reasons discussed below.

Claims 7-10 Are in a Form Indicated as Allowable:

The Office Action indicates Claims 7-10 are objected to, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 7 has been amended above to place it in form for allowance. Accordingly, Claims 7-10 are in form for allowance.

The Prior Art Rejections:

Claims 1-4, 6 and 10-12 stand rejected under 35 U.S.C. § 102 as being anticipated by United States Patent No. 6,297,527 to Agarwal *et al.* ("Agarwal"). Final Action, p. 2. Claim 5 stands rejected under 35 U.S.C. § 103 as being unpatentable over Agarwal in view of United States Patent Publication No. 2002/0075736 to Kumura *et al.* ("Kumura"). Final Action, p. 5. Under 35 U.S.C. § 102, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. § 2131 (quoting *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987)). "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" M.P.E.P. § 2112 (citations omitted) (emphasis added).

In rejecting independent Claim 1, the Office Action, asserts, among other things, that the platinum layer 74 of the lower electrode of Agarwal discloses the recited seed conductive

film and the dielectric layer 72 of Agarwal discloses a ferroelectric film "on the support insulating film 64 and the seed conductive film 74." Office Action, p. 3. Claim 1 has been amended above to recite that the seed conductive film is "on the lower electrode" and extends "on the support insulating film beyond the lower electrode and contacting the support insulating film." In contrast, as described in Agarwal, all the layers of the capacitor 240 are formed and then further "steps to create a functional memory cell containing the capacitor may now be carried out, such as the formation and etching of insulating layers." Agarwal, Col. 7, lines 23-25. The platinum layer 74 does not contact the protective layer 64 of Agarwal, relied on in the rejections as disclosing the recited support insulating film of Claim 1.

As described in the present specification, this structure may provide advantages not provided by the structure of Agarwal:

For the method for fabricating a ferroelectric capacitor illustrated in FIGs. 2-9, as the ferroelectric film 320 is formed after the lower electrode 280a and the seed conductive film 300a are completed, the ferroelectric film 320 need not be exposed to an etching atmosphere during etching of the lower electrode 280a and the seed conductive film 300a. **Furthermore, as the ferroelectric film 320 need not be subjected to the etching process used for separating the ferroelectric film 320 to define different cell units, the ferroelectric film 320 may not be subjected to damage during such an etching process.** (emphasis added)

Specification, p. 16, lines 12-19. Accordingly, Agarwal neither discloses nor suggests the structure of Claim 1. Accordingly, the rejections of Claim 1 and the claims that depend therefrom should be withdrawn for at least these reasons.

Newly added Claim 35 includes various recitations found in originally filed Claims 1 and 3. More particularly, newly added Claim 35 recites as follows:

A ferroelectric capacitor comprising:
a support insulating film on an integrated circuit substrate and having a trench therein;
a lower electrode on sidewalls and a bottom surface of the trench and having an upper portion extending from the trench to a height relative to the integrated circuit substrate greater than a height of the support insulating film;
a seed conductive film covering the upper portion of the lower electrode

extending from the trench **including covering a sidewall portion of the upper portion of the lower electrode extending from the trench;**
a ferroelectric film on the support insulating film and the seed conductive film; and
an upper electrode on the ferroelectric film. (emphasis added)

Applicants submit that at least the highlighted portions of Claim 35 are neither disclosed nor suggested by Agarwal.

As seen, for example, in Figure 1 of the present application, the seed conductive film 300a wraps around and covers the portion of the lower electrode 280a above the support insulating film 160, including extending along sidewalls defined by the portions of the lower noble metal 220a extending to a height above that of the support insulating film 160. In contrast, as discussed with reference to amended Claim 1, the deposit and etching sequence of Agarwal does not provide for forming the platinum layer 74 on a sidewall of the layers 76 or 78 as they are all etched together. Accordingly, Claim 35 is allowable for at least these additional reasons.

The dependent claims are patentable at least based on the patentability of the claims from which they depend. In addition, various of the dependent claims are separately patentable. For example, Claim 3 recites the seed conductive film covers a sidewall portion of the lower electrode extending from the trench. Accordingly, Claim 3 is separately patentable for reasons substantially similar to those discussed with reference to independent Claim 35. Newly added Claims 34 and 36 recite that the "ferroelectric film extends over all of the seed conductive film and extends beyond the seed conductive film over a portion of the support insulating film adjacent the seed conductive film." This arrangement can be seen, for example, in Figure 1 of the present application. Claims 34 and 36 are also separately patentable for at least these reasons as no such arrangement is disclosed or suggested by Agarwal.

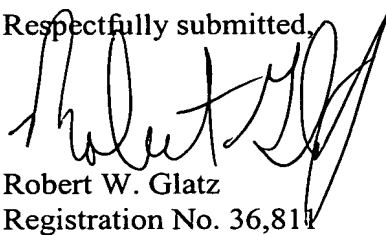
Conclusion

In view of the above, Applicants submit that the pending claims are in condition for

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allowance and respectfully request allowance of the present application. If further informalities are noted, the Examiner is encouraged to contact the undersigned by telephone to expedite allowance of the present application.

Respectfully submitted,

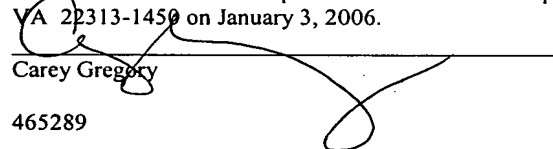


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